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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,506	12/14/2006	Agnes Bauk	20496-486	6057

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EXAMINER	
NGUYEN, COLETTE B	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
09/30/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/551,506	BAUK ET AL.	
	Examiner	Art Unit	
	COLETTE NGUYEN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the application

All the claims are as filed 12/23/2010.

Claims 1 to 23 are pending.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 1 to 23** are rejected under 35 U.S.C. 103(a) as obvious over Zhang Weiji et al. (CN 1281906) in view of Schummer et al. (US4,605,449) and Nakasugi et al. (US4,138,278)

2. Regarding claims 1, 3-8. Weiji (906) discloses a steel sheet for the production of a high strength, high toughness, and corrosion resistant steel mooring chain. He does not specify low temperature. Schummer (449) teaches a steel sheet for producing a rolled steel with high weld-ability, high yield strength with good notch impact toughness at very low temperature . Nagasugi (278) teaches a steel sheet with excellent toughness at low temperature with the weight percent as follows:

	Applicant	Nakasugi	Schummer	Wenji
C	0.16-0.25	0.01-0.13%	0.08-20%	0.25-0.33
Si	0.10-0.30	0.8-1.8%	0.20-0.40	0.15-0.30
Mn	0.80-1.60	0.01-0.08%	1.60%	1.45-1.75%

P	≤0.020%	silent	silent	≤0.020%
S	≤0.015%	<0.015	silent	≤0.015%
Cr	0.40 - 0.80%	<0.6%	silent	0.90-1.40%
Mo	0.30-0.50%	<0.015	0-0.3%	0.45-0.65%
Ni	0.70-1.20%	0.2-0.4	below 9%	1.00-1.20%
Al	0.020-0.06-%	0.08-0.4	0.03-0.30%	0.020-0.05%
N	0.007-0.018%	0.001-0.009	silent	≤0.009%
Nb	0.02-0.07%	silent	0-0.3no%	0.02-0.06%
The remainder being iron and impurities				

From the information given, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Schummer and Nakasugi of the carbon percent of lesser than 0.25-0.33% and the teaching of Nakasugi of Cr content of no more than 0.6% with the teaching of Weiji of a chain composition as Schummer discloses that to " *have high notch impact toughness throughout the cross section, and be easily welded, the carbon level is preferred to be less than 0.2% by weigh*t" (Col1, line 65-68). The claimed steel composition is obvious and encompassed by Wenji in view of Schummer and Nakasugi.

7. Regarding claim 2. Weiji in view of Schummer and Nakasugi disclose the steel sheet of claim 1. Wenji teaches C content of 25-33%, Schummer teaches C content of 0.08-0.20%, preferably 0.16 to 0.20%. It would have been obvious for one of ordinary skill in the art at the time of the invention to improve the steel sheet of Wenji, by lowering the carbon content as specifying by Schummer to have high notch impact toughness (especially for a chain).

8. Regarding claim 9. Schummer teaches that " the steel sheet has a grain structure in the finished product which is extremely fine and extends throughout the cross section..." (Col3, line, 58-63). Both Schummer and Wenji do not specify the grain size is finer than ASTM 10. However as the steel sheet components have overlapped weight percents, the steel sheet of Weiji in view of Schummer would inherently have the same characteristics as the instant claim.

9. Regarding claim 10. Weiji in view of Schummer and Nakasugi disclose a steel composition according to claim 1 for the production of high-strength components by cold forming with subsequent temper-hardening. (SChummer, Col.3, ln 48,and col.4, line 69) And (Wenji on page 2 and on page 5)

10. Regarding claims 11,12,13,14,15. Weiji in view of Schummer and Nakasugi teach the use of these steel according as claim 10 wherein the components are means for the carrying, pulling, lifting, conveying or securing of loads, means for the connections of structural elements, chains which are round and welded.

11. Regarding claims 16,17,18. Weiji discloses the tensile strength of level four mooring chain of more than 860 MPa. As tensile strength of the chain is an optimized parameter, it would have been obvious for one of ordinary skill in the art at the time of the invention to experiment with component weight percent to claim a higher tensile strength such as 1,200 MPa, 1,550 MPa, 1,600 MPa. And tensile strength is an inherent characteristic of the steel sheet with component weight percents that Wenji in view of Schummer already disclose.

12. Regarding claim 19. Weiji in view of Schummer disclose a use according to claim 10. Weiji discloses a tensile strength of more than 860 MPa, and he is silent about the FATT of the component at -60C. Schummer on the other hand discloses the fracture appearance transition temperature FATT of the components is at least -60C (SChummer, col4, lin 42)

13. Regarding claim 20. Weiji in view of Schummer and Nakasugi disclose a use according to claim 10. Notch impact is the same as Charpy impact, and Schummer teaches a Charpy V value of 35 J. Wenji teaches a V value of 110-150J. As the steel sheet of Weiji is modified to have less Carbon content the notch impact value is now should be between 35 and 110. Notch impact working value is an inherent characteristic of the steel sheet, the steel sheet of Wenji in view of Schummer would have similar notch impact as claimed.

14. Regarding claims 21 and 22, while Weiji and Schummer and Nkasugi do not disclose specific crack initiation toughness, as the composition of the steel taught by Weiji in view of Schummer, and the strength, notch impact, and elongation characteristics are similar, it is expected that the crack initiation toughness would also be commensurate.

15. Regarding claim 23. Schummer discloses an elongation at break of more than 20. (Schummer, table 1,2, elongation 25-36%)

Response to Arguments

3. Applicant's arguments filed 07/21/2010 have been fully considered but they are not persuasive for the following reasons: The instant claims pertain to a steel composition with excellent toughness, high strength at low temperature suitable for the manufacture of high-strength chains. The subject matter as a whole is unpatentable under US 35 USC103(a) as obvious by Wenji (CN1281906) who discloses a steel composition with all the elements similar as the instant claims with overlapping or butting weight range except Chromium with a 0.1% higher (0.9-1.4% vs 0.4-0.8%) in view of Nakasugi (278) who also discloses a steel composition with excellent toughness at low temperature, particularly the teaching of chromium impact on HAZ (Heat Affected Zone) with further in view of Schummer (449) who also teaches a steel product having high weld-ability, high yield strength and good notch impact toughness at very low temperature wherein carbon content and niobium/vanadium/molybdenum relationship are discussed.

a. **0.40-0.80% Cr range**: Wenji application is a mooring chain used in sea water where corrosion from salt is a concern therefore the Chromium is at least 0.9% as a lower limit. Applicant's application is for securing and loading at low temperature therefore corrosion is not the priority. Nakasugi (278) also teaches a steel composition with excellent toughness at low temperature with chromium at no more than 6% by wt and when present in an excessive amount, increases the harden-ability of HAZ (Heat Affected Zone) and lowers the toughness and the resistance to the welding cracks

(Col8, line 12-15). Therefore, it would have been obvious for anyone with ordinary skill in the art at the time of the invention with the desire to improve Wenji 's steel would incorporate the teaching of Nakasugi about the chromium percentage and experiment with a lower percentage of 6% or less and with optimization would come up with a range of 0.4 0.8 wt%. Particularly in view of the fact that;

> "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974)

As for the argument that the combination of Nakasugi and Wenji is improper because the proposed combination would render Wenji inoperable for its intended purpose. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine,* 837 F.2d 1071,5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones,* 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Wenji and Nakasugi teach steel with excellent toughness at low temperature and the application is not particularly for use in sea water but to only securing or fastening loads, It would have been obvious for one of ordinary skill in the art at the time of the invention to learn from both teaching and with experimentation and optimization would certainly combine and

substitutes the teaching of lowering content to improve the welding performance and mechanical strength at low temperature. The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law. *In re Fine*, 837 F .2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F .2d 347, 21 USPQ2d 1941 (Fed. Cir.1992). See also *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) (setting forth test for implicit teachings); *In re Eli Lilly & Co.,* 902 F .2d 943, 14 USPQ2d 1741 (Fed. Cir. 1990) (discussion of reliance on legal precedent*); In re Nilssen*, 851 F .2d 1401, 1403, 7 USPQ 2d 1500, 1502 (Fed Cir., 1988) (references do not have to explicitly suggest combining teachings); *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat App & Inter. 1985) (examiner must present convincing line of reasoning supporting rejection); and *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat App & Inter. 1993) (reliance on logic and sound scientific reasoning). Wenji teaches a lower range for chromium of 0.9% and Nakasugi teaches that at higher than 6% of chromium, it would affect the HAZ of the weld therefore it would be obvious for anyone who wants to improve further the toughness of the chain, would find way to improve the mechanical strength of the chain by improving the performance of the weld which is the weakest link in steel. As the difference here is only 0.1% wt, unless the applicant would show an unexpected result at 0.8% over Wenji, the claimed chromium range of 0.4- 0.8% is a mere optimization over Wenji in view of Nakasugi and Schummer.

b. “Nakasugi teaches away from Nb-steel and Wenji requires the presence of 00.02-0.06%Nb”. As it is known in the art and the applicant also discusses that the keys for the a steel with high strength, low temperature toughness are the contents of Cr, Ni and N and the minimum sum of the contents of Nb and V (equal to 0.020%) (Para 20). Wenji teaches to use a R4 steel with a low Nb range of 0.2-0.6%, Nakasugi teaches a relationship between Vanadium, Niobium and Molybdenum in Nb-steel and V-steel with preference of a V-steel of vanadium content limit to 0.02%-0.20%. (COl 3, line 40-68, col 4, line 1-25 and col7, line 45-65) as the application is for gas pipes. Schummer teaches an alloy containing manganese, silicon, and/or niobium and/or vanadium and/or molybdenum can be fabricated with a high yield strength, and a high notch impact toughness with a low percent of Nb of no more than 0.3% (Col 3, 39-45 and col 6). It would be obvious for one in the art to know from Schummer that steel of no niobium can also by used and it is not contradicting with the teaching of Wenji as the key elements to toughness at low temperature are not niobium but Cr, Ni and N at the right % for a low carbon steel.

c. **0.16 to 0.25 % C**. Wenji teaches C 0.25-0.33%, Nakasagi teaches 0.01-0.13% and Schummer teaches 0.08-20%, more specifically, at 0.18% (Col4, line 38). The claimed range of 0.16 to 0.25% which was amended from 0.8 to 0.25% to overcome the prior art has yet to show any unexpected result therefore it is obvious over Wenji in view of Nakasagi and Schummer.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is (571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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/COLETTE NGUYEN/
Examiner, Art Unit 1793

September 27, 2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793